CBO PAPERS

COMPARING CBO AND CENSUS INCOME STATISTICS

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PREFACE

In recent years, the Congressional Budget Office (CBO) has published statistics showing how the distribution of income among families has changed. The Bureau of the Census also publishes income statistics. While analyses by the two offices find similar changes in the distribution of income between 1977 and 1989, details of the analyses differ significantly. This CBO paper examines differences in both data and methodology used by CBO and the Census Bureau to determine how and why their statistics differ.

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Sherwood Kohn edited the paper, and Denise Jordan prepared it for publication.

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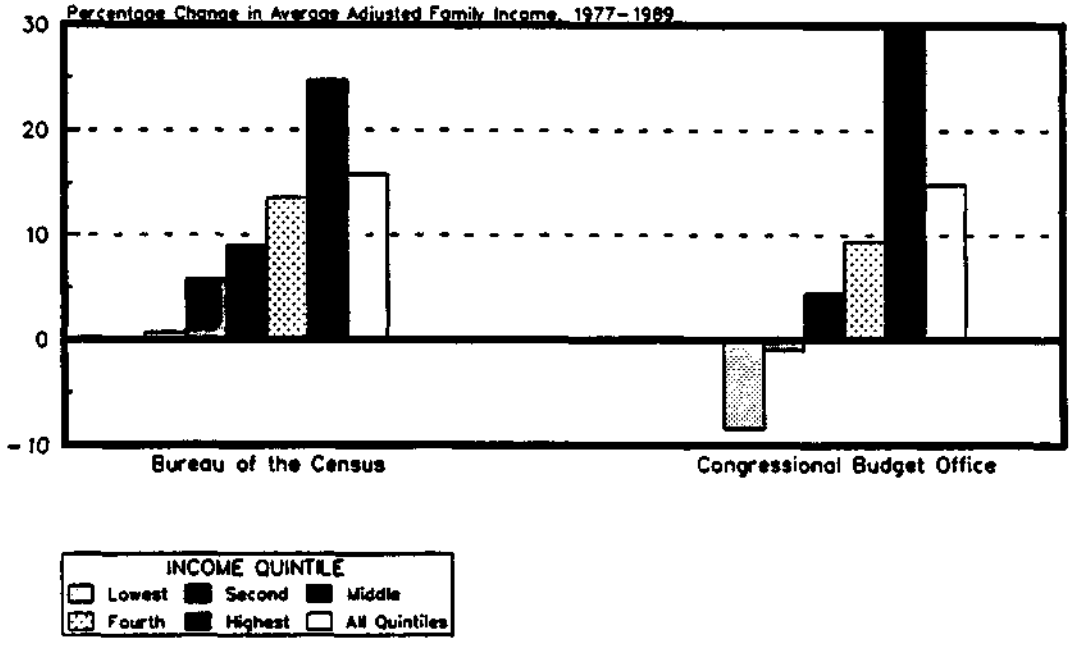
CONTENTS

FIGURES

BOXES

Studies of the income distribution among American families have revealed that, while average family income grew over the last 15 years, income inequality also increased. The studies diverge, however, on the details of these changes. In particular, income statistics reported by the Census Bureau and the Congressional Budget Office (CBO) both show that, between 1977 and 1989, average family income increased about 15 percent and families at the top of the income distribution fared better financially than those at the bottom (see Figure 1). Because they use different methods of measuring incomes, however, the two agencies disagree on the degree to which income changed for families at different points in the income distribution. Compared with Census Bureau data, CBO statistics show less income growth for families in the bottom four-fifths of the distribution and more growth for families in the top fifth (see Table 1).

FIGURE 1.
PATTERNS OF INCOME GROWTH ACCORDING TO THE BUREAU OF THE CENSUS AND THE CONGRESSIONAL BUDGET OFFICE



SOURCE: Congressional Budget Office

TABLE 1. GROWTH IN AVERAGE FAMILY INCOME, 1977-1989 (In percent)

Income Quintile[b]	Census Measure[a] Change Over Entire Period	Census Measure[a] Average Annual Change	CBO Measure Change Over Entire Period	CBO Measure Average Annual Change
Lowest	0.7	0.1	-8.4	-0.7
Second	5.8	0.5	-1.0	-0.1
Middle	9.0	0.7	4.5	0.4
Fourth	13.6	1.1	9.4	0.7
Highest	24.8	1.9	29.6	2.1
All Quintiles	15.8	1.2	14.9	1.2

SOURCES: Census measure based on Bureau of the Census, *Money Income of Households, Families and Persons in the U.S.: 1988 and 1989*, Current Population Reports, Series P-60, No. 172 (July 1991) p. 358; Congressional Budget Office (CBO) measure based on tabulations of data from the March 1978 and 1990 Current Population Surveys and of the 1977 and 1989 Statistics of Income.

a. The Census Bureau has published income statistics using two alternative price indices to adjust for price changes over time. The statistics shown here are adjusted for price changes between 1979 and 1989 using the CPI-X1 index, which reflects the official indexing methodology used by the Bureau of Labor Statistics since 1983. Since 1992, the Census Bureau has used the CPI-X1 to adjust income statistics.

b. Each income quintile represents one-fifth of all people (not families), ranked by either the Census Bureau or the CBO measure of family income, as appropriate.

Both Census Bureau and CBO income statistics use the March Current Population Survey (CPS) as their starting point. The two agencies reach divergent conclusions about income changes because they consider different populations, include income from different sources, and divide the population into different groups. Both agencies divide the population into fifths, or quintiles, on the basis of family income. CBO defines quintiles on the basis of individuals, however, while the Census Bureau uses families. Each CBO quintile contains 20 percent of the population but not necessarily 20 percent of all families. The reverse holds for Census Bureau quintiles.

In addition, CBO adjusts the basic CPS data to reflect information from federal tax returns, primarily to improve the data for use in tax models, but also to measure more accurately incomes of families at the top of the distribution. CBO's primary use of these income data is for tax models that simulate tax policy options. For these models, data that conform to information from tax returns are essential. In addition, because of legal penalties for misreporting on tax returns, many analysts feel that information from returns is more accurate than survey data.

Finally, CBO adjusts incomes to take account of family size and provide a better measure of family well-being, an especially important matter in a period of rapid changes in family composition. Despite the differences that cause the variance between Census Bureau and CBO income statistics, both agencies generally concur about the changing distribution of income.

THE CENSUS MEASURE OF INCOME

Census Bureau income statistics come directly from the March CPS, an annual survey that asks respondents about income received during the previous calendar year from a wide range of sources. The Census Bureau weights sample responses to represent the noninstitutional population of the United States and uses information from reporting families to assign income values to respondents who say they received particular types of income but do not report how much. Incomes above specific levels are capped at those levels. For example, earnings above $300,000 from a worker's main job are currently reported as $300,000. The levels at which incomes are capped--or top-coded--vary among sources and years. Incomes from most sources are currently capped at $100,000, although some, such as public assistance and Social Security benefits, are top-coded at lower values. These values have been raised periodically over the years. In 1977, wage and salary incomes were capped at $50,000. They are now top-coded at either $300,000 or $100,000. Note that top-coding affects only families at the top of the income distribution. This top-coding affects few families, although it may result in a significant understatement of their incomes. In addition, income data made available to researchers outside the Census Bureau are currently capped at $100,000, even when the Bureau's internal top-coding is at a higher value. Income statistics calculated by non-Census researchers will thus differ from Census Bureau estimates for high-income families. The survey includes most forms of cash income, but omits capital gains (the value of assets sold during the year less their initial cost).

Comparisons of CPS data with other sources of information, such as the national income and product accounts, federal tax returns, and administrative data from Social Security and other transfer programs, indicate that the CPS finds too few recipients of many kinds of income. They also indicate that income totals reported and assigned for most sources are significantly below actual levels. Despite efforts by the Census Bureau to correct for underreporting, the CPS appears to underrepresent families at the very top and bottom of the income distribution.

CBO'S ADJUSTMENTS TO CENSUS BUREAU DATA

CBO adjusts the CPS data to measure incomes more completely and family well-being more accurately. CBO then analyzes that measure for the entire noninstitutionalized population, not just Census families, and focuses on the well-being of individuals.

Adjusting Incomes to Reflect Data from Tax Returns

CBO incorporates information from federal income tax returns of individuals. The actual adjustment process involves raising or lowering incomes from particular sources for groups of people so that the aggregate amount and distribution of income from each source approximates that given by data from federal tax returns.[1] The adjustments have the greatest effect on high-income families whose recorded incomes are underreported and top-coded by the CPS. The total income of families in the top quintile, or fifth of the population, is increased by at least 10 percent in every year examined. The impact of the adjustments--particularly those to earnings--has changed over the last 15 years for families in the middle three quintiles. Adjusting CPS earnings for those quintiles in order to match tax data changed them little in 1977, but reduced them by about 5 percent in 1989.[2]

CBO makes two offsetting adjustments affecting the average income of families in the lowest quintile. First, as it does for the other quintiles, CBO adjusts CPS incomes to reflect information from tax returns. Second, CBO excludes families with negative incomes from the lowest quintile. The net effect of the two adjustments was to increase the average family income of the lowest quintile by about 6 percent in 1977 and to lower it by about 2 percent in 1989. The net effect of the two adjustments on the lowest quintile was roughly the same as the effect on the middle three quintiles of the adjustment to reflect tax information.

Adjusting CPS incomes to reflect data from tax returns lowers average income for the bottom quintile substantially, with the size of the reduction growing over time. This outcome is principally the result of an increase in the amount of negative incomes reported on tax returns.

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1. For a more complete discussion of the adjustment process, see Richard A. Kasten and Frank J. Sammartino, "A Method for Simulating the Distribution of Combined Federal Taxes Using Census Tax Return and Expenditure Data," in Gordon H. Lewis and Richard C. Michel, eds., *Microsimulation Techniques for Tax and Transfer Analysis* (Washington, D.C.: The Urban Institute Press, 1990).

2. Income comparisons discussed in this section are based on incomes adjusted for family size.

Families can have negative incomes in a given year only if they lose money on rental properties, on capital investments, or in their own businesses. Many losses are created for tax purposes and do not reflect truly negative incomes. As a result, families that have negative incomes are more like families in higher income quintiles, in terms of both consumption and income received from other sources.

Compared with other families in the lowest quintile, families with negative incomes are less likely to be headed by a person under 35 or over 65, more likely to be headed by a married couple than by a single person, and more likely to have children. On average, heads of families with negative incomes have attended more years of school and are more than twice as likely to have graduated from college. Only their incomes from wages and Social Security are similar to those of other families in the lowest quintile. Their average property incomes--rents, interest, dividends, and capital gains--are roughly the same as those of families in the top two quintiles. Overall incomes of these families are negative almost entirely because of losses from self-employment. Because they do not fit the usual concept of low-income families, including them in the bottom quintile would distort that group's characteristics. Consequently, CBO excludes families with negative incomes from the lowest quintile. This difference from the Census Bureau's methodology affects only the lowest income quintile. Both CBO and Census Bureau analyses include families with zero or negative incomes in calculating average incomes for all families. Furthermore, families with negative incomes are included in the lowest quintile in ranking families so that their exclusion from statistics for the lowest quintile does not affect the classification of other families. Excluding these families raises income in the bottom quintile by increasing amounts between 1977 and 1989.

Counting Capital Gains and Taxes Paid by Businesses as Income

CBO includes nominal realized capital gains and taxes paid by businesses as family income; the Census Bureau includes neither of these in its most widely used measure of income. The Census Bureau includes estimates of realized capital gains in some alternative measures of income it has been investigating in recent years.[3] Capital gains are concentrated among high-income families. Counting nominal realized gains increases the average income of families in the highest quintile by between 6 percent and 12 percent, depending on the year, but raises average income of families in other quintiles by less than 2 percent. (Income comparisons discussed in this section are based on incomes adjusted

3. See, for example, Bureau of the Census, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1979 to 1991*, Current Population Reports, Series P-60, No. 182-RD (August 1992).

for family size.) Economists would prefer to count real accrued rather than nominal realized capital gains as income, but good data on real accrued gains are unavailable. CBO therefore uses nominal realized gains. The effects on incomes of including realized capital gains were roughly the same in 1989 as they were in 1977.

Some taxes are collected from companies instead of from individuals, but, like all taxes, still reduce family income indirectly. These taxes must be included in a measure of income before taxes. CBO therefore adds the employer's share of payroll taxes and corporate income taxes to family incomes. Total payroll taxes are distributed among workers in proportion to their earnings. Corporate income taxes are split equally between workers and the owners of capital. Half of total corporate income tax revenue is allocated to workers, again in proportion to their earnings, and half is assigned to the owners of capital in proportion to their property income. Counting these taxes in pretax income does not alter measures of after-tax income. Including payroll taxes paid by employers and corporate taxes raises average pretax family income by about 7 percent. The effect is again greater for higher-income families; families in the top four quintiles pay roughly twice as large a share of their incomes in corporate taxes and payroll taxes paid by employers as families in the lowest quintile, partly because they are more likely to have earnings and thus be subject to payroll taxes and partly because they own more capital. Corporate taxes and payroll taxes paid by employers were a smaller part of income in 1989 than in 1977. Payroll taxes paid by employers increased as a percentage of income between 1977 and 1989, while corporate income taxes declined. In combination, the two taxes made up a smaller share of income in 1989 than in 1977.

Adjusting Incomes for Family Size

CBO adjusts family incomes to approximate the ways in which the varying needs of different size families affect their well-being. The Census Bureau does not adjust family incomes for family size, but does publish income statistics separately for families of different sizes. CBO calculates adjusted family income (AFI) by dividing each family's money income by the poverty threshold appropriate for the family's size. The official poverty thresholds are income levels used by the Bureau of the Census to determine whether people are poor in a given year. CBO modifies those thresholds by using an alternative consumer price index (known as the CPI-X1 and since 1983 the basis for the official consumer price index) to adjust for price changes since 1967. In addition, CBO simplifies the thresholds so that they vary only by size of family and not by age of the head of the family or by the number of children, as the official thresholds do.

CBO's method of ranking families by AFI rather than unadjusted income moves larger families to lower positions in the income distribution and smaller families to higher positions. Because families are smaller now than in the past--average family size has declined about 10 percent, from nearly 2.7 people in 1977 to 2.4 in 1989--adjusting incomes for family size reduces CBO's income measure compared with the Census Bureau's measure by less in 1989 than in 1977. If there had been no change in average family size between 1977 and 1989--and average family cash income equaled the 1989 value--the average AFI in 1989 for all families would have been about 5 percent lower than it actually was. These data cover families of all sizes, including those with only one member. The decline in average family size resulted from both an increase in the fraction of families with only one member and a decrease in the average number of people in families with two or more members.

Including Unrelated Individuals

CBO income statistics cover a larger part of the population than the Census Bureau's published data on family incomes. In order to cover the entire noninstitutionalized population in its statistics, CBO includes unrelated individuals--people not living with relatives--referring to them as one-person families. By contrast, the Census Bureau includes only families with at least two members. The Census Bureau publishes separate sets of statistics for unrelated individuals and for households--groups of people who live together, regardless of their relationships to one another. The household statistics cover the same population as CBO's income statistics, but group people together differently.

Unrelated individuals make up about 14 percent of the population and about one-third of all families. Both of these shares have increased over the last two decades. The classification of unrelated individuals includes not just the young who have not married, but also widows, widowers, and divorced people of all ages. Among those over age 14, more than one-third are between age 35 and age 64, and just over one-fourth are elderly. Because the average incomes of one-person families are significantly lower than those of larger families, the act of including them in calculations of average adjusted family income lowers average AFI by between 8 percent and 9 percent, compared with the average AFI of families having two or more members. Note that using AFI rather than unadjusted family income reduces the disparity between the incomes of one-person families and larger families, because the adjustment for family size reduces measured incomes of larger families in relation to those of smaller families.

Defining Income Quintiles

CBO defines income quintiles on the basis of people, not families, so that each quintile contains one-fifth of the noninstitutionalized population. The Census Bureau uses quintiles consisting of equal numbers of families. Person-based quintiles count people equally in the distribution, while family-based quintiles give less weight to people in large families than to people in smaller families.

Both the poorest and the richest families, ranked by AFI, are slightly smaller than average. As a result, using people-based quintiles increases the number of families in both the lowest and highest quintiles, although the magnitude of this effect has declined over time. Using people-based quintiles rather than family-based quintiles raises the average AFI for the lowest quintile by about 7 percent in 1977 and about 2 percent in 1989; for the highest quintile, the change decreases average AFI in those two years by 3 percent and 1 percent, respectively.

The effect of moving from family-based quintiles to person-based quintiles would be substantially larger if family incomes were measured in cash rather than adjusted for family size. Using cash incomes, family size rises with income. Therefore, using person-based quintiles increases the number of families in the lowest quintile but decreases the number in the highest quintile. These shifts cause average family cash income in the lowest quintile to rise by 31 percent in 1977 and 24 percent in 1989. For the highest quintile, the comparable figures are increases of 11 percent and 13 percent, respectively.

EFFECTS ON MEASURED GROWTH OF FAMILY INCOME

The uses of different data and definitions described above, not surprisingly, result in differences between rates of income growth as calculated by the Census Bureau and CBO (see Table 2). For CBO families, adjusting CPS incomes to reflect tax return information and counting realized capital gains and taxes paid by businesses as income make estimated income growth lower for the bottom four quintiles and raise growth for the top quintile. Using the CBO income measure, CBO's demographic adjustments--including unrelated individuals as one-person families, adjusting incomes for family size, and using person-based income quintiles--increase the estimate of income growth for all quintiles. There are significant interactions among the various adjustments. The effects of the adjustments for the 1977-1989 period (see Table 2) are similar to those found for subperiods (see tables in the appendix).

TABLE 2. EFFECTS OF CONGRESSIONAL BUDGET OFFICE INCOME ADJUSTMENTS ON CHANGE IN AVERAGE FAMILY INCOME BETWEEN 1977 AND 1989 (In percentage points)

Income Adjustment	Income Quintile[a]					All Quintiles
	Lowest	Second	Middle	Fourth	Highest	
Effects of CBO Income Adjustments Using CBO Demographics[b]						
Adjust CPS Incomes to Reflect Federal Individual Income Tax Data[c]	-7.3	-7.1	-6.8	-6.6	4.9	-1.4
Count Realized Capital Gains and Taxes Paid by Businesses as Income	0.3	-1.1	-0.8	-0.3	0.1	-0.4
Both Income Adjustments	-7.0	-8.2	-7.6	-6.9	5.0	-1.8
Effects of CBO Demographic Adjustments Using CBO Incomes[d]						
Adjust Income for Family Size	1.0	8.1	8.4	6.7	5.1	5.9
Include Unrelated Individuals as One-Person Families	3.9	0.2	-0.9	-1.1	-2.7	-1.8
Define Quintiles Based on Persons	-4.1	-2.7	0.3	1.6	1.8	0
All Three Demographic Adjustments[e]	2.5	3.5	3.9	2.9	1.5	2.5

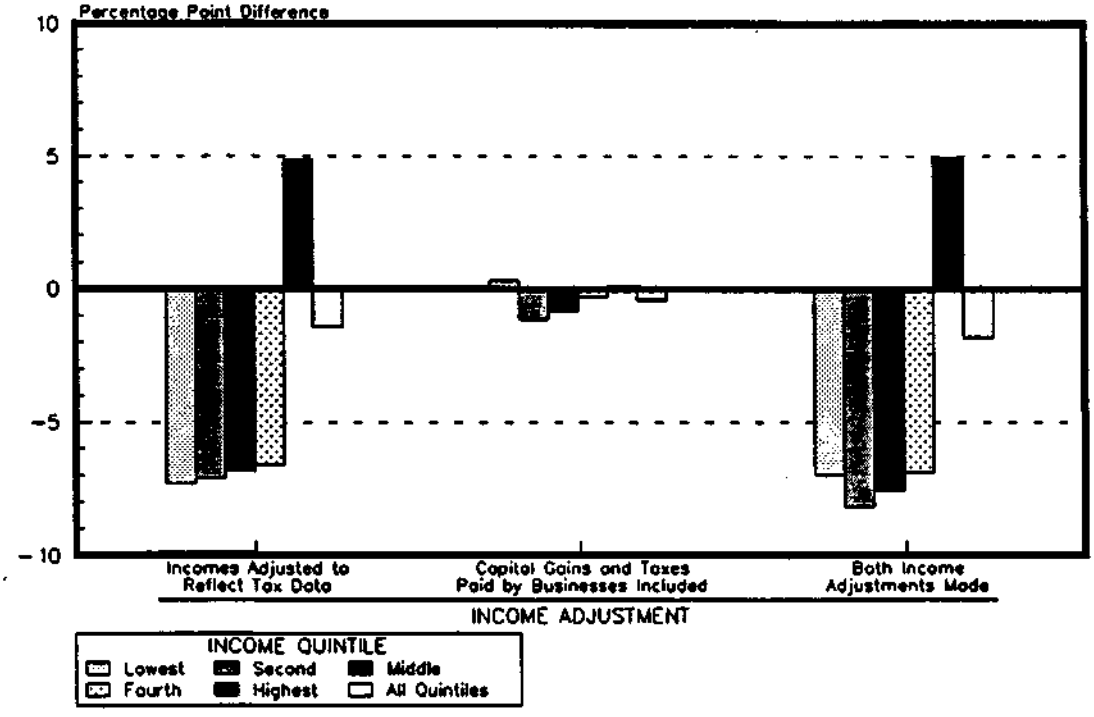
SOURCE: Congressional Budget Office tabulations of data from the March 1978 and 1990 Current Population Surveys (CPSs) and from the 1977 and 1989 Statistics of Income.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.
b. Measurements include unrelated individuals as one-person families and adjust incomes for family size.
c. Effect includes interaction with including realized capital gains and taxes paid by businesses.
d. Changes based on incomes adjusted to match information from tax returns and including realized capital gains and taxes paid by businesses.
e. The effect of all three demographic adjustments differs from the sum of the individual effects because of interactions among the adjustments.

Income Adjustments

Two of CBO's adjustments change the amounts of income received by families between 1977 and 1989 (see Figure 2 and Table 2). Adjusting incomes reported on the CPS to reflect information from federal individual tax returns has the effect of reducing measured income growth between 1977 and 1989 for the entire population by 1.4 percentage points. The result differs sharply among income quintiles. The use of tax data reduces income growth over the period by about 7 percentage points for each of the bottom four quintiles, but increases it by nearly 5 percentage points for the highest quintile. The lower growth for the bottom quintiles results primarily from the fact that earnings shown in data from tax returns have grown more slowly than those reported on the CPS. The higher growth for the top quintile appears to result mostly from undoing the top-coding of incomes in the CPS, which has become more restrictive over time.

FIGURE 2.
EFFECTS OF INCOME ADJUSTMENTS ON THE MEASURED GROWTH OF AVERAGE ADJUSTED FAMILY INCOME, 1977–1989



SOURCE: Congressional Budget Office

CBO's second income adjustment, counting realized capital gains and taxes paid by businesses as income, has a much smaller effect on income growth. Including income from those two sources makes income growth lower for all families between 1977 and 1989 by just under one-half of one percentage point. The effect is greatest for the second and middle quintiles, lowering growth by about 1 percentage point, because both their capital gains income and their share of taxes paid by business grew less rapidly than their average income. For the lowest and highest quintiles, counting capital gains and taxes paid by business raises income growth slightly, but for different reasons.

For low-income families, taxes paid on their behalf by businesses--primarily payroll taxes--grew faster than income and offset a slightly slower growth in their capital gains income. For families in the top income quintile, more rapid growth of capital gains compared with all income more than offset the slower growth of corporate taxes and payroll taxes paid by employers.

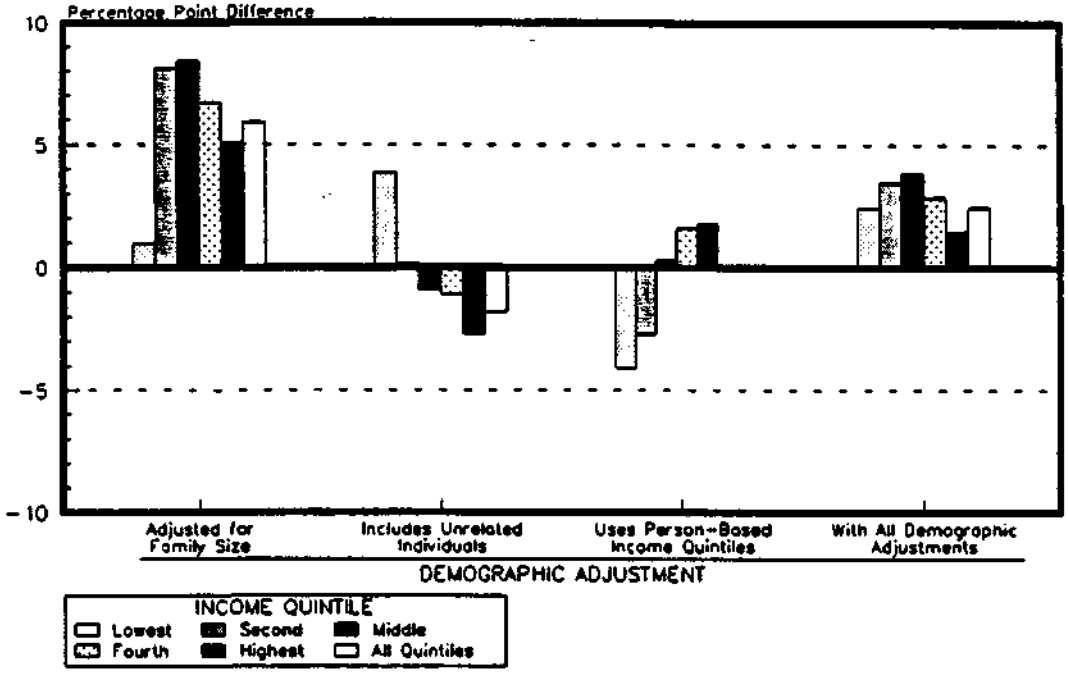
In combination, the CBO adjustments to income lower the measured growth of average family income between 1977 and 1989 by nearly 2 percentage points. In the bottom four quintiles, the adjustments reduce measured growth by between 7 and 8 percentage points. For high-income families, the changes raise income growth by 5 percentage points.

Demographic Adjustments

CBO's three demographic adjustments affect income growth over the 1977-1989 period in sharply different ways (see Figure 3 and Table 2). Adjusting incomes for family size yields higher measures of income growth for every quintile; including unrelated individuals as one-person families reduces measured growth for the top three quintiles and raises growth for the bottom two. By contrast, using quintiles based on individuals reduces growth for families in the bottom two quintiles but increases it for families in the top three quintiles.

Adjusting incomes for family size increases measured income growth because families have become smaller over time. Between 1977 and 1989, average family size declined from about 2.7 to 2.4 people per family. Smaller families reduce the downward adjustments that occur when the AFI measure replaces unadjusted family income and thus make the growth in AFI greater than the growth in unadjusted family income. Over the 1977-1989 period, average AFI grew nearly 6 percentage points faster than average family cash income (see Table 2).

FIGURE 3.
EFFECTS OF DEMOGRAPHIC ADJUSTMENTS ON THE MEASURED GROWTH OF AVERAGE ADJUSTED FAMILY INCOME, 1977–1989



SOURCE: Congressional Budget Office

Average AFI increased more--or declined less--than average cash income in every income quintile. In the top four quintiles, the change in average AFI was between 5 percentage points and 8 percentage points greater than the change in unadjusted income. The effect was smaller in the bottom quintile. Bigger families made up a larger share of families in that quintile in 1989 than in 1977 as their incomes declined in relation to the incomes of smaller families. The decline in average income of these larger families, however, tempered the effect of the drop in average family size. As a result, average AFI declined for families in the lowest quintile by about 1 percentage point less than average unadjusted income.

Including unrelated individuals as one-person families reduces the measured income growth of all families, even though their average AFI grew at virtually the same rate as that of larger families. Average AFI for one-person families and that for families with two or more members both increased 17 percent between 1977 and 1989. Over the same period, however, the proportion of all families with only one member increased. Because one-person families generally have lower AFIs, this shift in the distribution of

families reduced the growth rate of average adjusted family income for all families. Average AFI for families of all sizes (the CBO population) grew nearly 2 percentage points less than that for families with two or more members (the Census Bureau's population).

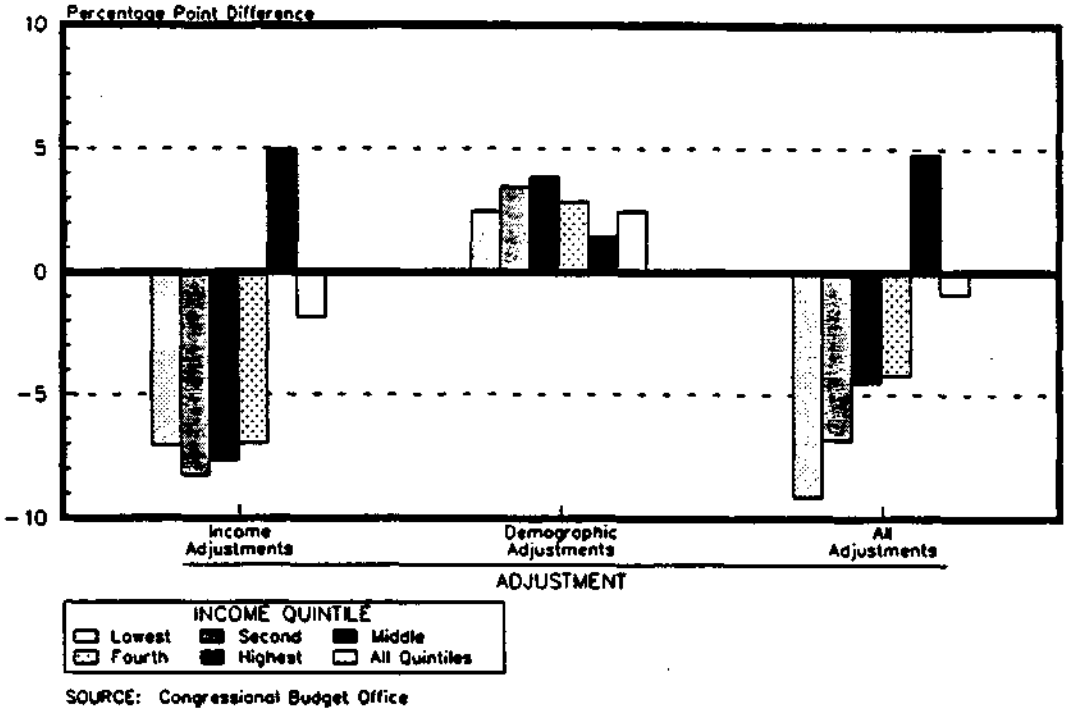
The effect of including unrelated individuals declines as income rises across quintiles. The inclusion increases measured growth of average AFI by about 4 percentage points in the lowest quintile and decreases growth by nearly 3 percentage points in the top quintile. Two circumstances cause this pattern. First, unrelated individuals are more concentrated in the bottom two quintiles than in the upper quintiles; therefore, including them has a greater impact on the lower quintiles. Second, the average income of unrelated individuals increased faster than that of larger families in the bottom three quintiles but more slowly in the top two quintiles. In combination, these factors raised growth rates in the bottom two quintiles and lowered them in the other quintiles.

Defining quintiles on the basis of persons rather than families has no effect on the growth of average AFI for all families but does affect individual quintiles. (How quintiles are defined has no effect on the average income for all families considered as a group, since choice of quintiles does not change which families are included in calculating average income.) The effect increases with income among quintiles. Using quintiles based on individuals lowers income growth by 4 percentage points and 3 percentage points, respectively, in the bottom two quintiles and raises it by nearly 2 percentage points in the top two quintiles. This pattern results from a more even distribution of families of different sizes among quintiles in 1989 than in 1977. Because families in the lowest and highest quintiles are smaller than average, using quintiles based on individuals raises the average income of the lowest quintile and lowers that of the top quintile. These effects have declined since 1977, leading to the observed pattern of impacts on measured growth rates of incomes.

In combination, CBO's three demographic adjustments increase measured growth of income for all families by 2.5 percentage points. Similar effects occur for each income quintile, although the impact is slightly larger for the middle three quintiles and smaller for the highest quintile.

Overall, the demographic adjustments have smaller effects than the income adjustments. As a result, their positive impacts on income growth in the bottom four quintiles only partially offset the negative effects of the income adjustments (see Figure 4). For the top quintile, CBO's demographic adjustments augment the income adjustments, yielding greater measured income growth.

FIGURE 4.
EFFECTS OF CONGRESSIONAL BUDGET OFFICE ADJUSTMENTS ON THE MEASURED GROWTH OF AVERAGE ADJUSTED FAMILY INCOME, 1977–1989



SOURCE: Congressional Budget Office

CONCLUSIONS

The Census Bureau and CBO present different measures of family incomes, but both measures show the same general pattern of recent income growth. The analyses of both agencies indicate that average family income grew about 15 percent between 1977 and 1989. Both also show significant increases in income inequality over the period, with smaller income gains--or larger declines--for families in the lower quintiles and larger gains for families in the top quintiles. The income changes for individual quintiles, however, differ substantially. CBO data show an 8 percent drop in average income for the lowest quintile, compared with a small increase shown in the Census Bureau data. Growth rates for incomes of the middle three quintiles are between 4 percentage points and 7 percentage points lower for CBO than for the bureau's data. For the top quintile, CBO data show income growth nearly 5 percentage points greater than Census Bureau data.

These differences result from CBO's more inclusive definition of income and families. Adjusting CPS incomes to reflect information from tax returns improves the measurement of incomes of families at the top of the income distribution because it removes the effects of underreporting and top-coding. Counting realized capital gains and taxes paid by businesses as family income and adjusting incomes for family size yield more complete measures of pretax income. The use of income quintiles based on individuals counts all people equally, regardless of how large their families are.

Finally, including unrelated individuals as one-person families yields income statistics for more of the population, compared with the Census Bureau's definition of families. In recent published reports, the Census Bureau has emphasized income measures for households rather than for families. Because a household is defined as a group of people living together, regardless of their relationships, households include the same population as CBO's definition of families--both comprise the entire noninstitutionalized population. Household data, however, group people together differently than CBO's family-based data, which separate families within households. As a result, the Census Bureau's measures of income changes for households also differ from CBO's estimates for families.

APPENDIX: DETAILS OF METHODOLOGICAL DIFFERENCES

Census Bureau and Congressional Budget Office (CBO) income statistics differ primarily because of the five major methodological differences discussed in the body of this memorandum. Additional, but minor, differences between Census Bureau and CBO income data affect reported statistics only slightly. For example, incomes are capped at lower levels in the Current Population Survey (CPS) files available to users outside the Census Bureau than in the Bureau's internal files. CBO has access only to the public CPS files. But CBO's subsequent adjustment of incomes to reflect tax information more than compensates for the disparity.

Similarly, prior to 1992, the Census Bureau used the official consumer price index (CPI-U) to adjust for inflation. CBO uses an alternative price index, the CPI-X1. The method used to compute the CPI-U was changed in 1983 to that used for the CPI-X1. Values of the CPI-U for earlier years, however, were not revised to reflect the new methodology. The CPI-X1 index used by CBO and since 1992 by the Census Bureau is calculated with the new methodology using 1967 as the starting year. For the period 1967 through 1982, the CPI-X1 indicates about 10 percent less inflation than does the CPI-U. Using the CPI-X1 rather than the CPI-U thus results in higher estimates of growth in constant dollar income over periods before 1983. Differences between CBO statistics and Census Bureau data based on the CPI-U can be eliminated simply by readjusting the Census Bureau data using the CPI-X1. In 1992, the Census Bureau switched to the CPI-X1, so that the difference no longer occurs.

A final minor difference between the Census and CBO files affects interest incomes for years before 1985. In 1985, the Census Bureau changed its method for providing values of interest income received by people who reported getting interest but did not give amounts. CBO has adjusted interest incomes for 1977 and 1980 to make them consistent with more recent years. The small effect of this adjustment--an increase of less than 1 percent--is swamped by CBO's subsequent changes of income amounts to reflect tax information.

A Note on Measuring the Effects of Adjustments

How much of the difference between the CBO and Census Bureau measures of income can be attributed to any one of CBO's adjustments depends on the order in which the adjustments are made. Interactions among the adjustments mean that the effect of one adjustment on average income will differ, depending on whether it is assessed before or after other adjustments have been made. For example, the effect of including unrelated individuals as one-

person families is not the same when measured using unadjusted family incomes as it is when incomes have been adjusted for family size.

Except where otherwise noted, the effects of adjustments shown in this appendix are the difference between the final CBO measure of income and a measure that incorporates all adjustments except the one being assessed. In other words, the effects of each adjustment are measured as if that adjustment had been made last, after the other four adjustments. Thus, for example, the reported effect of adjusting incomes for family size equals the difference between income or income growth measured after all five CBO adjustments have been made--including the adjustment for family size--and the same measure incorporating all but the family size adjustment.

Because this approach excludes interactions among adjustments, the effects of combinations of adjustments generally do not equal the sum of the effects of the adjustments considered individually. The size of interactions can be inferred as the difference between the combined effects and the sum of the individual effects. For example, the two income adjustments together lower the growth of average family income between 1977 and 1989 by 1.8 percentage points, while the three demographic adjustments together raise that growth by 2.5 percentage points (see Table 2 on page 9). If the income and demographic adjustments did not interact, the overall effect of all five adjustments would be to increase measured growth by the sum of the income and demographic effects; -1.8 percentage points and 2.5 percentage points, or 0.7 percentage points. In fact, the net effect is to lower measured growth of average income by 0.9 percentage points, indicating that the interactions among the income and demographic adjustments lower measured income growth by 1.6 percentage points (-0.9 percentage points minus 0.7 percentage points).

Adjusting Incomes to Reflect Data from Tax Returns

CBO adjusts family incomes in the CPS to reflect both the size and distribution of incomes reported on federal tax returns, as shown in the Internal Revenue Service's Statistics of Income (SOI). The actual adjustment process involves raising or lowering incomes from particular sources for groups of people so that the total amount and distribution of income from each source approximates that given by data from federal tax returns.[1] The adjustment corrects the effects of top-coding and increases incomes that appear to be underreported in the CPS files. In addition, tax data provide information for

1. For a more complete discussion of the adjustment process, see Richard A. Kasten and Frank J. Sammartino, "A Method for Simulating the Distribution of Conbined Federal Taxes Using Census Tax Return and Expenditure Data," in Gordon H. Lewis and Richard C. Michel, eds., *Microsimulation Techniques for Tax and Transfer Analysis* (Washington, D.C.: The Urban Institute Press, 1990).

the wealthiest families, which appear most likely to be missed by the CPS. Note, however, that tax returns cannot provide additional information for the other group that may be underrepresented in the CPS, namely families at the bottom end of the income distribution. Adjusting CPS data to totals from tax returns increases average family income by between 4 percent and 5 percent, depending on the year (see Table A-1).

Adjusting CPS data to tax return totals and distributions primarily affects families with high incomes because their incomes are underreported and top-coded. For families in the top fifth--or quintile--of the income distribution, average incomes were raised by at least 10 percent in every year examined.[2] For families in other income quintiles, the adjustments have changed markedly. For 1977, CPS incomes of families in the middle three quintiles were raised slightly--about 1 percent. By 1989, however, the adjustments lowered average incomes of those families by between 5 percent and 6 percent.

CBO makes two offsetting adjustments affecting the incomes of families in the lowest income quintile. First, as it does for the other quintiles, CBO adjusts CPS incomes to reflect information from tax returns. This procedure generates significant amounts of negative income for some families and consequently reduces average income of the quintile substantially. The size of the reduction has grown, principally because the amount of negative income reported on tax returns has increased since 1977.

Because this addition of negative income moves recipient families that are otherwise better off into the lowest income quintile, CBO makes a second adjustment. People can have negative incomes in a given year only if they lose money on rental properties, on capital investments, or in their own businesses. Furthermore, many losses are created for tax purposes and do not reflect truly negative incomes. Families with these losses differ from typical low-income families in terms of both the income they receive from other sources and their consumption.

For example, the average property income--from rents, interest, dividends, and capital gains--of families with negative incomes is approximately the same as that of families in the top two quintiles and many times that of other low-income families. In addition, the heads of families with negative incomes are more likely than heads of families with low but positive incomes to be middle-aged and married, have children, and have college degrees. Be-

2. CBO defines income quintiles by ranking all individuals by the total family income and dividing that distribution into fifths. Because quintiles represent fifths of all people, not of families, each quintile will not necessarily contain 20 percent of all families. Quintiles discussed in this appendix are defined separately for each measure of income considered.

TABLE A-1. ADJUSTING CURRENT POPULATION SURVEY INCOME DATA TO REFLECT TAX RETURN INFORMATION, SELECTED YEARS

Income Quintile[a]	1977	1980	1985	1989
Average Adjusted Family Income, CPS Data[b]				
Lowest	0.87	0.85	0.80	0.86
Second	1.94	1.96	1.95	2.08
Middle	2.91	2.97	3.05	3.27
Fourth	4.10	4.22	4.43	4.77
Highest	7.24	7.34	8.21	9.02
All Quintiles	3.40	3.46	3.68	3.96
Average Adjusted Family Income, Combined CPS and SOI Data[c]				
Lowest	0.92	0.88	0.82	0.84
Second	1.95	1.92	1.88	1.95
Middle	2.94	2.94	2.98	3.10
Fourth	4.14	4.18	4.37	4.54
Highest	7.95	8.21	9.07	10.30
All Quintiles	3.58	3.62	3.82	4.13
Average Family Income, Combined CPS and SOI Data as a Percentage of CPS Data				
Lowest	105.7	103.5	102.5	97.7
Second	100.5	98.0	96.4	93.8
Middle	101.0	99.0	97.7	94.8
Fourth	101.0	99.1	98.6	95.2
Highest	109.8	111.9	110.5	114.2
All Quintiles	105.3	104.6	103.8	104.3

SOURCE: Congressional Budget Office tabulations of data from various years of the March Current Population Survey and of the Statistics of Income.

NOTES: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

CPS = Current Population Survey; SOI = Statistics of Income.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

b. Average income for all families, including unrelated individuals, adjusted for family size. Excludes capital gains and taxes paid by businesses. Families with zero or negative incomes are included in both the lowest quintile and totals.

c. Average income for all families, including unrelated individuals, adjusted for family size. Excludes capital gains and taxes paid by businesses. Families with zero or negative incomes are excluded from the lowest quintile but included in totals.

cause of these differences, to include families with negative incomes in the lowest quintile would distort the characteristics of that quintile. CBO therefore excludes such families in computing statistics for the lowest income quintile, and includes them only in values for the entire population. (CBO counts families with zero or negative incomes in defining the bottom quintile, and excludes them only in calculating statistics for that quintile. Both CBO and the Census Bureau include those families in calculating statistics for all families as a group.) By contrast, the Census Bureau includes people with zero or negative incomes in the lowest quintile. The net effect of these two adjustments for families in the lowest quintile is to raise average income nearly 6 percent in 1977 but to lower it more than 2 percent in 1989 (see Table A-1).

The increased magnitude of the effects of these adjustments to income results from a growing disparity in the total amount and distribution of earnings reported on the SOI and the CPS. In 1977, the two sources of income data differed little in terms of earned income, but SOI earnings grew more slowly over the 1980s. By 1989, the SOI showed about 5 percent lower total earnings than did the CPS. This disparity raises the question of which data are more accurate, a question that remains unanswered. CBO uses information from the SOI to maintain consistency among sources of income and in the relationship between income and taxes paid. CBO analysts also believe that tax returns are likely to be more accurate than survey responses. To reflect the amounts and distribution of earnings shown in the SOI, CBO has adjusted the earnings of families in the lower four quintiles downward in recent years.

These changes reduce measured income growth for the bottom four quintiles during the 1977-1989 period by 7 percentage points compared with that shown in the Census Bureau data (see Table A-2). For the top quintile, however, the adjustment is upward in all years and larger in 1989 than in earlier years; it therefore increases the estimated growth in average income by about 5 percentage points for that group.

Counting Capital Gains and Taxes Paid by Businesses as Income

The Census Bureau and CBO measure income differently. CBO includes nominal realized capital gains and corporate and payroll taxes. The Census Bureau omits both. A complete measure of annual income would include the increase in value during the year of a family's financial assets, adjusted for inflation, but good data on such real accrued capital gains do not exist. CBO has chosen to include nominal realized capital gains--the value of assets sold during the year less their acquisition cost, with no adjustment for inflation--rather than exclude income from capital gains entirely. Data on nominal realized gains are readily available from tax returns. In the individual income

TABLE A-2. PERCENTAGE CHANGE IN AVERAGE ADJUSTED FAMILY INCOME, SELECTED PERIODS

Income Quintile[a]	1977-1980	1980-1985	1985-1989	1977-1989
Unadjusted CPS Incomes[b]				
Lowest	-2.3	-5.4	6.8	-1.4
Second	1.2	-0.4	6.4	7.2
Middle	1.9	2.6	7.2	12.1
Fourth	3.0	4.9	7.7	16.3
Highest	1.5	11.8	9.9	24.6
All Quintiles	1.7	6.6	7.6	16.7
Combined CPS-SOI Incomes[c]				
Lowest	-4.1	-6.6	1.9	-8.7
Second	-1.5	-2.2	3.9	0.1
Middle	-0.1	1.4	4.0	5.3
Fourth	1.1	4.5	3.9	9.7
Highest	3.3	10.5	13.5	29.5
All Quintiles	1.2	5.5	8.0	15.3

SOURCE: Congressional Budget Office tabulations of data from various years of the March Current Population Survey and of the Statistics of Income.

NOTES: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

CPS = Current Population Survey; SOI = Statistics of Income.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

b. Average income for all families, including unrelated individuals, adjusted for family size. Excludes capital gains and taxes paid by businesses. Families with zero or negative incomes are included in both the lowest quintile and totals.

c. Average income for all families, including unrelated individuals, adjusted for family size. Excludes capital gains and taxes paid by businesses. Families with zero or negative incomes are excluded from the lowest quintile but included in totals.

tax, realized capital losses that can offset ordinary income are limited to $3,000 per year. Without this limitation, taxpayers could avoid taxes by realizing losses but postponing the realization of gains. CBO uses the same limitation in its measure of income.

For most reports, the Census Bureau has chosen to exclude capital gains. In recent years, the Census has produced statistics on alternative measures of income, some of which include estimated values of realized capital gains. The Census uses SOI data from tax returns to assign gains to individuals and families in the CPS.[3] In its principal reports on family income, however, the Census Bureau does not count capital gains as income.

Including realized capital gains in measured incomes raises average adjusted family income (AFI) by between 4 percent and 7 percent, depending on the year (see Table A-3). Realized gains are much more concentrated than other sources of income among high-income families. They make up between 6 percent and 12 percent of average AFI in the top quintile, depending on the year, but less than 2 percent of average AFI for families in the bottom four quintiles. Including gains therefore increases average AFI in the highest income quintile and has little effect on family incomes in others.

Realized gains increased faster than average AFI between 1977 and 1985, but grew more slowly than AFI between 1985 and 1989. Over the entire 1977-1989 period, realized gains increased slightly as a share of AFI. As a result, counting gains raises 1977-1989 measured income growth in the top quintile by about 2 percentage points (see Table A-4). For all families, including realized gains increases AFI growth by less than 1 percentage point.

Taxes paid by business either raise prices or lower incomes of employees and investors. Consequently, the burden of taxes paid by businesses is ultimately shared among workers, who receive lower real wages, and by shareholders and other recipients of capital income, who receive lower real dividends, rents, interest payments, capital gains, and business profits. In any case, business taxes reduce family income. Incomes reported on the CPS and on individual income tax returns measure what people receive after businesses pay taxes. As a result, taxes paid by businesses must be included in a complete measure of income before all taxes. CBO therefore includes estimates of each family's share of payroll taxes paid by employers and corporate income taxes in its measure of pretax income. Economists disagree on the distribution of corporate income taxes among workers and owners of capital. For most analyses, CBO allocates half of corporate taxes to workers and half to owners

3. See, for example, Bureau of the Census, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1979 to 1991*, Current Population Reports, Series P-60, No. 182-RD (August 1992).

TABLE A-3. AVERAGE ADJUSTED FAMILY INCOME, COUNTING REALIZED CAPITAL GAINS AND CORPORATE AND EMPLOYER-PAID PAYROLL TAXES, SELECTED YEARS (Percentage change compared with income excluding both items)

Income Quintile[a]	1977	1980	1985	1989
Including Realized Capital Gains				
Lowest	1.1	1.1	1.2	0
Second	1.5	1.0	0.5	1.0
Middle	1.4	1.0	1.0	1.0
Fourth	1.7	1.4	1.4	1.3
Highest	5.8	6.7	11.9	7.4
All Quintiles	3.6	3.9	6.5	4.4
Including Corporate and Employer-Paid Payroll Taxes[b]				
Lowest	4.3	3.4	4.9	4.8
Second	7.2	6.3	6.4	6.7
Middle	7.8	6.8	6.7	7.1
Fourth	7.5	7.4	7.1	7.7
Highest	8.2	7.4	6.6	7.0
All Quintiles	7.8	7.2	6.5	6.8
Including Both Realized Capital Gains and Corporate and Employer-Paid Payroll Taxes[b]				
Lowest	5.4	4.5	6.1	6.0
Second	8.7	7.3	7.4	7.7
Middle	9.2	8.2	7.7	8.1
Fourth	9.2	8.9	8.5	8.8
Highest	14.3	14.3	18.6	14.4
All Quintiles	11.7	11.0	13.1	11.1

SOURCE: Congressional Budget Office tabulations of data from various years of the March Current Population Survey and of the Statistics of Income.

NOTE: Adjusted family income equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

b. Income includes the employer's share of employer-paid federal payroll taxes and federal corporate income taxes.

TABLE A-4. AVERAGE ADJUSTED FAMILY INCOME, COUNTING REALIZED CAPITAL GAINS AND CORPORATE AND EMPLOYER-PAID PAYROLL TAXES, SELECTED PERIODS (Percentage change in average adjusted family income)

Income Quintile[a]	1977-1980	1980-1985	1985-1989	1977-1989
Excluding Realized Capital Gains and Corporate and Employer-Paid Payroll Taxes[b]				
Lowest	-4.1	-6.6	1.9	-8.7
Second	-1.5	-2.2	3.9	0.1
Middle	-0.1	1.4	4.0	5.3
Fourth	1.1	4.5	3.9	9.7
Highest	3.3	10.5	13.5	29.5
All Quintiles	1.2	5.5	8.0	15.3
Including Realized Capital Gains and Excluding Corporate and Employer-Paid Payroll Taxes[b]				
Lowest	-4.4	-6.6	1.9	-9.1
Second	-1.8	-2.5	3.9	-0.6
Middle	-0.4	1.3	4.1	5.0
Fourth	0.9	4.5	3.9	9.5
Highest	4.1	16.0	9.0	31.5
All Quintiles	1.3	8.2	5.9	16.0
Excluding Realized Capital Gains and Including Corporate and Employer-Paid Payroll Taxes[b]				
Lowest	-4.6	-6.1	2.5	-8.1
Second	-2.3	-2.1	4.0	-0.6
Middle	-0.7	1.2	4.3	4.8
Fourth	0.9	4.1	4.5	9.8
Highest	2.6	9.7	13.9	28.2
All Quintiles	0.4	5.0	8.4	14.3
Including Realized Capital Gains and Corporate and Employer-Paid Payroll Taxes[b]				
Lowest	-4.9	-5.9	2.3	-8.4
Second	-2.5	-2.3	3.9	-1.0
Middle	-1.0	1.2	4.2	4.5
Fourth	0.7	4.1	4.3	9.4
Highest	3.2	14.7	9.5	29.6
All Quintiles	0.6	7.5	6.3	14.9

SOURCE: Congressional Budget Office tabulations of data from various years of the March Current Population Survey and of the Statistics of Income.

NOTE: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

b. Income includes the employer's share of employer-paid federal payroll taxes and federal corporate income taxes.

of capital. There is greater agreement that payroll taxes are borne entirely by workers in the form of lower compensation, and the CBO analysis uses that assumption.[4] Counting these taxes in pretax income has no effect on measures of after-tax income. The Census Bureau excludes taxes paid by businesses from its measures of pretax family income.

Including corporate and employer-paid payroll taxes raises average family AFI by between 7 percent and 8 percent (see Table A-3). The effect is again greater for higher-income families; families in the top four quintiles pay roughly twice as large a share of their incomes in payroll taxes paid by employers and corporate taxes than do families in the lowest quintile. Because the sum of corporate and employer-paid payroll taxes grew less than average income over the 1977-1989 period (although payroll taxes grew faster than income), including them lowers the measured growth of average family income slightly (see Table A-4).

In combination, counting both realized capital gains and corporate and employer-paid payroll taxes as income increases average AFI by between 11 percent and 13 percent (see Table A-3). The increase is greater for families with high incomes than for those with low incomes, primarily because families in the top quintile have larger amounts of realized capital gains. These adjustments raise the average income of families in the top quintile by between 14 percent and 18 percent, while increasing pretax AFI for families in the lowest quintile by only between 5 percent and 6 percent. Because the more rapid growth in realized gains was offset by the slower growth of corporate income taxes and payroll taxes paid by employers between 1977 and 1989, the combined effect on measured income growth of including them both is small (see Table A-4). The adjustments reduce income growth only slightly for the entire population (from 15.3 percent to 14.9 percent) and increase it slightly for the top quintile (from 29.5 percent to 29.6 percent).

Adjusting Incomes for Family Size

Because smaller families need less income to attain a given standard of living than larger families, incomes adjusted to account for differences in family size arguably provide a better measure of well-being than unadjusted incomes. CBO uses the equivalence scale implicit in the federal poverty thresholds to calculate adjusted family income, or AFI (see Box A-1). This calculation provides a single measure of living standards that can be applied to families of different sizes. Specifically, total family cash income is divided by the relevant

4. See Congressional Budget Office, *The Changing Distribution of Federal Taxes: 1975-1990* (October 1987), pp. 19-23.

Box A-1.
Poverty Thresholds and Equivalence Scale

The official poverty thresholds are income levels used by the Bureau of the Census to determine whether people are poor in a given year. The thresholds vary by family size, number of children, and, for small families, whether the head is elderly. CBO uses simplified thresholds that vary only by family size. The equivalence scale--the ratio of the poverty threshold for a given family size to that for a family with one member--implicit in these thresholds is the relationship among the needs of families of different sizes. For example, the poverty thresholds imply that a family of four requires about twice as much income as a person living alone to reach the same standard of living. The poverty thresholds and resulting equivalence ratios used for 1989 are the following:

Family Size	Poverty Threshold	Equivalence Scale
1	$6,311	1.00
2	$8,076	1.28
3	$9,885	1.57
4	$12,675	2.01
5	$14,990	2.38
6	$16,921	2.68
7	$19,162	3.04
8	$21,328	3.38
9 or more	$25,480	4.04

poverty threshold to obtain AFI. AFI is thus a unitless measure of family cash income as a multiple of the poverty threshold.[5] When families are ranked by AFI instead of total income, larger families move to lower positions in the income distribution and smaller families move up.

Using AFI to measure the relative income of different size families affects estimates of income growth because of the significant demographic

5. For a detailed discussion of this adjustment, see Congressional Budget Office, *Trends in Family Income: 1970-1986* (February 1988), pp. 5-6.

changes that have occurred in recent years. In particular, between 1977 and 1989, average family size declined by about 10 percent--from nearly 2.7 people per family to 2.4 people per family. Because smaller families generally require less income than larger families to attain a given standard of living, ignoring the decline in average family size either understates the growth of average family well-being or overstates its decline. During the 1977-1989 period, average family income grew nearly 15 percent by the AFI measure, compared with 9 percent by the unadjusted measure (see Table A-5). (Note that the distribution shown in the bottom panel of Table A-5 uses income adjusted for family size to distribute families among income quintiles and to measure average family income.) A similar pattern holds for all but the lowest income quintile; income growth over the period was between 5 percentage points and 9 percentage points higher when measured by AFI rather than unadjusted income.

By contrast, for the lowest quintile, AFI shows a decline in average family income 1 percentage point lower than that based on unadjusted income. This difference for the lowest quintile results from the changing composition of families in the quintile. Between 1977 and 1989, the incomes of unrelated individuals increased throughout the income distribution, while average incomes of larger families rose less rapidly and fell in the bottom three quintiles. As a result, unrelated individuals became less likely to be in the bottom quintile and larger families became more likely. The increased concentration of larger families in that quintile, in combination with the greater adjustment of their incomes for family size, yields a measured drop in average AFI that is slightly less than the decline in average unadjusted family income.

Including Unrelated Individuals

Census Bureau and CBO income statistics cover different populations. The principal Census Bureau series on incomes is for families, defined as two or more related people living in the same residence. As a result, the Census Bureau's income statistics for families exclude people not living with relatives, referred to as unrelated individuals. The Census Bureau has argued that unrelated individuals are qualitatively different from families and therefore should be considered separately. Omitting these individuals from the most commonly cited measure of income leaves out an important and growing part of the population. Unrelated individuals make up about one-seventh of the population and receive about one-fifth of all income. Furthermore, they span the entire population and include divorced and widowed people as well as those who never married. More than one-third are between 35 and 64 and about one-fourth are elderly. Because they are important, CBO includes un-

TABLE A-5. PERCENTAGE CHANGE IN AVERAGE FAMILY INCOME, ADJUSTING FOR FAMILY SIZE, SELECTED PERIODS

Income Quintile[a]	1977-1980	1980-1985	1985-1989	1977-1989
CBO Income Measure Not Adjusted for Family Size; Families Ranked by Unadjusted Income				
Lowest	-6.2	-6.5	3.4	-9.4
Second	-6.2	-4.7	1.7	-9.1
Middle	-3.7	-2.9	2.7	-3.9
Fourth	-2.0	1.7	3.0	2.7
Highest	1.5	12.0	9.5	24.5
All Quintiles	-1.6	5.3	5.2	9.0
CBO Income Measure Adjusted for Family Size; Families Ranked by Income Adjusted for Family Size				
Lowest	-4.9	-5.9	2.3	-8.4
Second	-2.5	-2.3	3.9	-1.0
Middle	-1.0	1.2	4.2	4.5
Fourth	0.7	4.1	4.3	9.4
Highest	3.2	14.7	9.5	29.6
All Quintiles	0.6	7.5	6.3	14.9

SOURCE: Congressional Budget Office tabulations of data from various years of the March Current Population Survey and of the Statistics of Income.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

related individuals as one-person families in calculating its income statistics. Furthermore, CBO's adjustments for family size should reduce the differences between unrelated individuals and larger families, as well as between families of different sizes.

In the last few years, the Census Bureau has put increased emphasis on household income statistics. Households are groups of people living in the same residence, regardless of their relationship to each other. These statistics therefore cover the same population as CBO's income statistics, but the groupings are different. For example, in Census household statistics, two unrelated adults living together constitute a single household. In CBO's family income statistics, the same people would be two one-person families. They would be excluded entirely from Census family income statistics.

Because one-person families have average incomes significantly lower than larger families, including them in calculations of average family income yields markedly lower estimates of income levels (see Tables A-6, A-8, and A-10). Between 1977 and 1989, the average AFI of unrelated individuals rose from about two-thirds to more than three-fourths of the average AFI of families with two or more members. Including one-person families in the computation of income statistics lowers overall average income by between 8 percent and 9 percent for all families. The size of the effect declines as income rises, except in the lowest and highest quintiles in recent years (see Table A-8).

Including unrelated individuals has reduced the measured income growth of all families, despite the fact that their average AFI increased at virtually the same rate as that of larger families. Between 1977 and 1989, the average AFIs of both one-person families and families with two or more members grew by 17 percent. Over the same period, however, one-person families became a larger fraction of all families, rising from 29 percent to 35 percent (see Table A-9). This increasing share of one-person families, which have lower incomes, has produced slightly lower measured income growth; average income for families of all sizes (the CBO population) grew by about 15 percent between 1977 and 1989, compared with about 17 percent for families with two or more members (the Census Bureau population).

Tabulations including unrelated individuals, however, show faster income growth for families in the lowest income quintile than do tabulations of Census families only, the reverse of the situation for the top three quintiles and for all families (see Table A-10). Unrelated individuals generally have lower incomes than larger families, so their increase as a proportion of all families tends to lower the rate of income growth in all quintiles. Average AFI rose between 1977 and 1989 for unrelated individuals in all quintiles, however, while that of larger families declined in the bottom two quintiles. For the lowest quintile, the growth of average AFI for one-person families offset in part the decline in average AFI of larger families. Consequently, for that quintile, average income declined only about 5 percent for all families, compared with nearly 17 percent for families with two or more members.

Defining Income Quintiles

Finally, CBO defines income quintiles on the basis of people, so that each quintile contains one-fifth of the noninstitutionalized population. The Census Bureau uses quintiles consisting of equal numbers of families. Quintiles based on individuals count people equally in the distribution, while family-based quintiles give less weight to people in large families than to people in smaller families. Because families of different sizes are not spread evenly across the

TABLE A-6. AVERAGE ADJUSTED FAMILY INCOME BY INCOME QUINTILE AND FAMILY TYPE, SELECTED YEARS

Income Quintile[a]	1977	1980	1985	1989
	Unrelated Individuals			
Lowest	0.68	0.69	0.69	0.72
Second	1.33	1.40	1.48	1.60
Middle	2.30	2.41	2.55	2.67
Fourth	3.73	3.81	4.04	4.11
Highest	7.94	8.08	8.87	9.65
All Quintiles	3.17	3.26	3.49	3.73
	Families with Two or More Members			
Lowest	1.05	0.98	0.90	0.92
Second	2.24	2.19	2.12	2.21
Middle	3.30	3.28	3.31	3.47
Fourth	4.61	4.65	4.86	5.08
Highest	9.25	9.60	11.10	12.17
All Quintiles	4.34	4.37	4.71	5.04
	All Families			
Lowest	0.97	0.92	0.87	0.89
Second	2.12	2.06	2.02	2.10
Middle	3.21	3.18	3.21	3.35
Fourth	4.52	4.55	4.74	4.94
Highest	9.09	9.38	10.76	11.78
All Quintiles	4.00	4.02	4.32	4.59

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

NOTES: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

Incomes have been adjusted to reflect information from tax returns and differences in family size.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

TABLE A-7. AVERAGE FAMILY CASH INCOME BY INCOME QUINTILE AND FAMILY TYPE, SELECTED YEARS (In 1989 dollars)

Income Quintile[a]	1977	1980	1985	1989
		Unrelated Individuals		
Lowest	3,962	3,973	4,015	4,168
Second	7,776	8,171	8,666	9,261
Middle	13,344	14,010	14,813	15,453
Fourth	21,632	22,090	23,403	23,795
Highest	45,860	46,996	51,237	55,854
All Quintiles	18,375	18,923	20,182	21,583
		Families with Two or More Members		
Lowest	9,648	8,696	7,265	7,068
Second	23,372	22,223	21,547	22,281
Middle	34,836	33,992	33,684	34,997
Fourth	48,018	47,525	49,195	51,063
Highest	92,609	94,584	107,857	117,831
All Quintiles	41,707	41,408	43,920	46,652
		All Families		
Lowest	6,650	6,368	6,125	6,343
Second	16,442	15,668	15,361	15,679
Middle	27,843	26,660	26,142	26,586
Fourth	41,578	40,451	41,052	41,970
Highest	83,382	84,165	93,660	101,247
All Quintiles	35,011	34,468	36,142	38,008

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

NOTE: Incomes have been adjusted to reflect information from tax returns and converted to 1989 dollars using an alternative consumer price index (the CPI-X1).

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

TABLE A-8. AVERAGE ADJUSTED FAMILY INCOME OF UNRELATED INDIVIDUALS AND ALL FAMILIES, SELECTED YEARS
(As a percentage of average adjusted family income of families with two or more members)

Income Quintile[a]	1977	1980	1985	1989
	Unrelated Individuals			
Lowest	64.8	70.4	76.7	78.3
Second	59.8	64.4	70.3	72.4
Middle	69.7	73.8	77.3	76.9
Fourth	80.9	81.9	83.1	80.7
Highest	85.5	84.5	79.6	79.1
All Quintiles	73.0	74.6	73.9	73.8
	All Families			
Lowest	92.4	93.9	96.7	96.7
Second	94.6	94.1	95.3	95.0
Middle	97.3	97.0	97.0	96.5
Fourth	98.0	97.8	97.5	97.2
Highest	98.3	97.7	96.9	96.8
All Quintiles	92.2	92.0	91.7	91.1

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

NOTES: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

Incomes have been adjusted to reflect information from tax returns and differences in family size.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

TABLE A-9. UNRELATED INDIVIDUALS AND LARGER FAMILIES, SELECTED YEARS

Income Quintile[a]	1977	1980	1985	1989
	Unrelated Individuals (In thousands)			
Lowest	7,969	8,352	8,567	9,028
Second	4,556	5,613	6,696	8,030
Middle	3,477	4,443	5,403	6,611
Fourth	3,228	4,125	5,330	5,654
Highest	3,414	4,018	4,581	5,042
All Quintiles	23,097	27,139	31,357	35,196
	Families with Two or More Members (In thousands of families)			
Lowest	8,879	9,397	9,982	10,574
Second	10,704	11,413	11,956	12,436
Middle	11,154	11,907	12,819	13,170
Fourth	12,285	12,895	13,412	14,166
Highest	13,824	14,478	15,343	15,967
All Quintiles	57,349	60,798	64,316	66,882
	All Families (In thousands)			
Lowest	16,848	17,750	18,549	19,602
Second	15,260	17,026	18,652	20,467
Middle	14,630	16,350	18,222	19,781
Fourth	15,512	17,020	18,741	19,820
Highest	17,238	18,496	19,924	21,009
All Quintiles	80,445	87,937	95,673	102,078
	Unrelated Individuals as a Percentage of All Families			
Lowest	47.3	47.1	46.2	46.1
Second	29.9	33.0	35.9	39.2
Middle	23.8	27.2	29.7	33.4
Fourth	20.8	24.2	28.4	28.5
Highest	19.8	21.7	23.0	24.0
All Quintiles	28.7	30.9	32.8	34.5

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

a. Quintiles are defined for all families and each represents one-fifth of all persons.

TABLE A-10. PERCENTAGE CHANGE IN AVERAGE ADJUSTED FAMILY INCOME, BY QUINTILE AND FAMILY TYPE, SELECTED PERIODS

Income Quintile[a]	1977-80	1980-85	1985-89	1977-89
		Unrelated Individuals		
Lowest	0	0.9	4.5	5.4
Second	5.0	5.6	7.9	19.7
Middle	4.9	5.9	4.5	16.0
Fourth	2.0	6.1	1.7	10.0
Highest	1.8	9.8	8.7	21.5
All Quintiles	2.6	7.1	6.8	17.4
		Families with Two or More Members		
Lowest	-6.3	-8.5	2.4	-12.3
Second	-2.4	-2.9	4.3	-1.2
Middle	-0.7	1.1	4.9	5.4
Fourth	1.0	4.4	4.8	10.5
Highest	3.9	16.4	9.5	32.3
All Quintiles	0.7	8.4	6.9	16.7
		All Families		
Lowest	-4.9	-5.9	2.3	-8.4
Second	-2.5	-2.3	3.9	-1.0
Middle	-1.0	1.2	4.2	4.5
Fourth	0.7	4.1	4.3	9.4
Highest	3.2	14.7	9.5	29.6
All Quintiles	0.6	7.5	6.3	14.9

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

NOTE: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

a. Each income quintile represents one-fifth of all people (not families), ranked by the appropriate measure of income.

income distribution, the two approaches put different numbers of families in each quintile.

Both the poorest and the richest families, ranked by AFI, are slightly smaller than average (see Table A-11). As a result, using quintiles based on people increases the number of families in both the lowest and highest quintiles. For example, in 1977, quintiles based on families would each have contained about 16,100 families; quintiles based on people for that year had about 17,800 families in the lowest quintile and about 17,250 in the highest (see Table A-11). The additional families in the lowest quintile based on people have higher incomes than families in the lowest quintile based on families; therefore, average income for that quintile is increased by using people to define it. Conversely, the additional families in the highest quintile pull down average income because their incomes are lower than those in the highest quintile based on families.

Between 1977 and 1989, differences between quintiles based on families and individuals became smaller. The average size of families in the lowest quintile was about 10 percent smaller in 1977 than that of all families, but by 1989 the difference had shrunk to 3 percent. The same pattern applied to the top quintile, where the difference decreased from about 7 percent to 3 percent. These declines reduced the differences in average AFI calculated using the two definitions of quintiles. While average AFI for the lowest quintile in 1977 was about 7 percent higher when quintiles based on people were used rather than those based on families, it was only 2 percent higher in 1989 (see Table A-12). For the top quintile, the comparable values were about 3 percent lower in 1977 and just over 1 percent lower in 1989.

The effect of moving from quintiles based on families to quintiles based on people would be substantially larger if family incomes were measured in cash rather than adjusted for family size. Using cash incomes, family size rises with income, so using quintiles based on people increases the number of families in the lowest quintile but decreases the number in the highest quintile. These shifts cause average family cash income in the lowest quintile to rise by 31 percent in 1977 and 24 percent in 1989. For the highest quintile, the comparable figures are increases of 11 percent and 13 percent, respectively.

The narrowing of differences between average family incomes under the two definitions of quintiles has affected measured income growth differently among quintiles (see Table A-13). For the bottom two quintiles, average AFI did not grow as much between 1977 and 1989 using quintiles based on people rather than families. As a result, quintiles based on people yield lower values for income growth--4 percentage points and 3 percentage points lower for the

TABLE A-11. DISTRIBUTION OF FAMILIES AND PEOPLE BY INCOME QUINTILE, SELECTED YEARS

Income Quintile[a]	1977	1980	1985	1989
		Families (In thousands)		
Lowest	17,805	19,045	20,134	21,001
Second	15,260	17,026	18,652	20,467
Middle	14,630	16,350	18,222	19,781
Fourth	15,512	17,020	18,741	19,820
Highest	17,238	18,496	19,924	21,009
All Quintiles	80,445	87,937	95,673	102,078
		People (In thousands)		
Lowest	42,825	44,935	47,160	49,048
Second	42,869	44,995	47,210	49,103
Middle	42,846	44,955	47,220	49,085
Fourth	42,891	44,989	47,189	49,076
Highest	42,865	44,985	47,207	49,105
All Quintiles	214,296	224,859	235,986	245,417
		Average Family Size (Number of persons)		
Lowest	2.41	2.36	2.34	2.34
Second	2.81	2.64	2.53	2.40
Middle	2.93	2.75	2.59	2.48
Fourth	2.77	2.64	2.52	2.48
Highest	2.49	2.43	2.37	2.34
All Quintiles	2.66	2.56	2.47	2.40
		Average Family Size Relative to Overall Average (In percent)		
Lowest	90.3	92.3	95.0	97.1
Second	105.5	103.4	102.6	99.8
Middle	109.9	107.5	105.1	103.2
Fourth	103.8	103.4	102.1	103.0
Highest	93.3	95.1	96.1	97.2
All Quintiles	100.0	100.0	100.0	100.0

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

a. Quintiles are defined for all families and each represents one-fifth of all persons.

TABLE A-12. DEFINING INCOME QUINTILES, SELECTED YEARS

Income Quintile	1977	1980	1985	1989
Average Adjusted Family Income Using Family-Based Income Quintiles[a]				
Lowest	0.91	0.87	0.83	0.87
Second	2.02	1.98	1.97	2.06
Middle	3.19	3.16	3.21	3.33
Fourth	4.62	4.62	4.80	4.98
Highest	9.35	9.58	10.97	11.94
All Quintiles	4.00	4.02	4.32	4.59
Average Adjusted Family Income Using Person-Based Income Quintiles[b]				
Lowest	0.97	0.92	0.87	0.89
Second	2.12	2.06	2.02	2.10
Middle	3.21	3.18	3.21	3.35
Fourth	4.52	4.55	4.74	4.94
Highest	9.09	9.38	10.76	11.78
All Quintiles	4.00	4.02	4.32	4.59
Average Adjusted Family Income Using Person-Based Income Quintiles as a Percentage of That Using Family-Based Income Quintiles				
Lowest	106.6	105.7	104.8	102.3
Second	105.0	104.0	102.5	101.9
Middle	100.6	100.6	100.0	100.6
Fourth	97.8	98.5	98.8	99.2
Highest	97.2	97.9	98.1	98.7
All Quintiles	100.0	100.0	100.0	100.0

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income (CPS-SOI) data file.

NOTE: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

a. Each quintile consists of one-fifth of all families.

b. Each quintile consists of one-fifth of all persons.

TABLE A-13. EFFECTS ON MEASURED INCOME GROWTH OF ALTERNATIVE DEFINITIONS OF INCOME QUINTILES, SELECTED YEARS

Income Quintile	1977-1980	1980-1985	1985-1989	1977-1989
Change in Average Adjusted Family Income Using Family-Based Income Quintiles[a] (In percent)				
Lowest	-4.0	-4.0	3.9	-4.3
Second	-2.0	-0.7	4.5	1.7
Middle	-1.2	1.7	3.7	4.2
Fourth	0	4.0	3.6	7.8
Highest	2.5	14.5	8.9	27.8
All Quintiles	0.6	7.5	6.3	14.9
Change in Average Adjusted Family Income Using Person-Based Income Quintiles[b] (In percent)				
Lowest	-4.9	-5.9	2.3	-8.4
Second	-2.5	-2.3	3.9	-1.0
Middle	-1.0	1.2	4.2	4.5
Fourth	0.7	4.1	4.3	9.4
Highest	3.2	14.7	9.5	29.6
All Quintiles	0.6	7.5	6.3	14.9
Percentage Point Difference in Change in Average Adjusted Family Income, Person-Based Income Quintiles versus Family-Based Income Quintiles				
Lowest	-0.9	-1.9	-1.6	-4.1
Second	-0.5	-1.6	-0.6	-2.7
Middle	0.2	-0.5	0.5	0.3
Fourth	0.7	0.1	0.7	1.6
Highest	0.7	0.2	0.6	1.8
All Quintiles	0	0	0	0

SOURCE: Congressional Budget Office tabulations of data from the combined Current Population Survey-Statistics of Income data file.

NOTE: Adjusted family income is expressed as a multiple of the poverty threshold. It equals family cash income divided by the poverty threshold appropriate for the family's size. The thresholds used are official Census poverty thresholds, inflated from 1967 using the CPI-X1 and simplified to vary only by family size.

a. Each quintile consists of one-fifth of all families.

b. Each quintile consists of one-fifth of all persons.

lowest and second quintiles, respectively. The reverse held true for the top two quintiles: incomes for quintiles based on people did not shrink as much for quintiles based on families between 1977 and 1989. Using quintiles based on individuals therefore increased measured growth of average AFI by nearly 2 percentage points.